. . . connecting your business

LANCOM L-1302acn dual Wireless

Dual radio access point for Gigabit WLAN in modern enterprise environments

- 1 x Gigabit WLAN based on IEEE 802.11ac (5 GHz) with up to 1,300 Mbps
- 1 x WLAN based on IEEE 802.11n (2,4 or 5 GHz) with up to 450 Mbps
- Parallel operation at 2.4 and 5 GHz as well as IEEE 802.11n/ac for heterogeneous client environments
- Support of 3x3-MIMO, 80 MHz WLAN channels, and 256-QAM
- Support of DFS channels of the 5 GHz frequency band
- Professional WLAN optimization with LANCOM Active Radio Control
- Client Steering for an intelligent distribution of clients to the best access point

LANCOM
Systems

The LANCOM L-1302acn dual Wireless accelerates Wireless LAN to Gigabit speed. Thanks to the support of the modern WLAN standard IEEE 802.11ac a gross data rate of up to 1,300 Mbps is achieved. With its two WLAN radio modules both 11n clients (via 2.4 GHz) and the increasing number of modern 11ac clients (via 5 GHz) can be provided with high-speed WLAN. On top of that, LANCOM access points with IEEE 802.11ac are fully backwards compatible to older WLAN standards as 802.11a/b/g/n. Thus the increasing demand for bandwidth of current clients can be fulfilled.

High-speed enterprise applications.

With the rapid increase of mobile end devices in corporate environments and the habitually grown comfort of a wireless access, the demand for more bandwidth is growing as well. The LANCOM L-1302acn dual Wireless with the support of the new WLAN standard IEEE 802.11ac combines wireless freedom with the speed of wired networks. With a gross data rate of up to 1.3 Gbps the path is paved towards modern corporate applications with high demands for bandwidth. Applications with a high demand for bandwidth, so far only realizable via stationary cable networks, are now wireless and flexible due to the new WLAN standard. As a consequence, you can, for example, arrange telepresence applications location-independently without any loss of quality.

More performance.

In comparison to its predecessor IEEE 802.11n, the standard 802.11ac transmits exclusively at 5 GHz, with the benefit of more free, non-overlapping channels in contrast to the 2.4 GHz frequency band. Due to the wider 80 MHz radio channels and the more efficient modulation based on QAM-256, the resulting gross data rate per spatial stream is 433.3 Mbps. The LANCOM L-1302acn dual Wireless supports 3x3 MIMO and thus three spatial streams for an overall performance of 1,300 Mbps. This increase in speed is a big surplus especially for mobile clients such as tablet PCs or smart phones since the significantly shorter data transmission time leads to an increased battery lifetime.

Better and reliable coverage.

Keep in control over your wireless infrastructure! With the intelligent WLAN optimization concept LANCOM Active Radio Control (ARC) you sustainably optimize your radio field, proactively prevent sources of interference, and therefore use the full potential of your WLAN! As an example, the LANCOM L-1302acn dual Wireless supports Client Steering for an intelligent distribution of WLAN clients to the most ideal access point. As a consequence, the performance of your WLAN is significantly increased, especially in WLAN scenarios with a high number of end devices.

More management.

How much load is there on the network, what are the available data rates? How can you ensure that your well thought-out security policies are consistently implemented throughout the entire corporate network, even across different sites? LANCOM offers a variety of management options for networks of various sizes and in line with the customer's needs: Ranging from free, practical monitoring and configuration tools for very small networks to intelligent controller solutions that offer the cross-site monitoring and management of wireless networks. The L-13xx series offers the familiar LANCOM flexibility of management: Each access point can be operated in standalone mode and managed with the free administration tools, or it can be centrally managed by a LANCOM WLAN controller. Irrespective of whether the WLAN network is decentralized or centrally managed, a highly specialized monitoring solution is available with LANCOM LSM. This powerful monitoring and surveillance system for medium-sized and large networks is capable of monitoring up to 1,000 devices to give you secure control over your entire network infrastructure. For more information, visit www.lancom.de/en/lsm.

More reliability for the future.

LANCOM products are fundamentally designed for a product life spanning several years. They are equipped with hardware dimensioned for the future. Even reaching back to older product generations, updates to the LANCOM Operating System – LCOS – are available several times a year, free of charge and offering major features. LANCOM offers unbeatable protection of your investment!

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Features as of: LCOS 9.00

WLAN	
Frequency band 2.4 GHz and 5 GHz	2400 -2483.5 MHz (ISM) and 5150-5825 MHz (depending on country-specific restrictions)
Data rates IEEE 802.11n	Module 1: 1300 Mbps according to IEEE 802.11ac with MCS9 (Fallback to 6,5 Mbps with MCS0)
Data rates IEEE 802.11n	Module 2: 450 Mbps according to IEEE 802.11n with MCS23 (Fallback to 6,5 Mbps with MCS0)
Data rates IEEE 802.11b/g	Module 2: 54 Mbps to IEEE 802.11g (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection) compatible to IEEE 802.11b (11, 5.5, 2, 1 Mbps, Automatic Rate Selection), IEEE 802.11 b/g compatibility mode or pure g or pure b
Data rates IEEE 802.11a/ h	Module 1 a. 2: 54 Mbps (fallback to 48, 36 , 24, 18, 12, 9, 6 Mbps, Automatic Rate Selection), fully compatible with TPC (adjustable power output) and DFS (automatic channel selection, radar detection) according to EN 301 893
Output power at radio module, 5 GHz	Module 1: IEEE 802.11a/h: +18 dBm @ 6 up to 48 MBit/s and +16 dBm @ 54 MBit/s IEEE 802.11ac: +16 up to +18 dBm @ MCS0-7 20/40/80 MHz, +14 dBm @ MCS8 20/40/80 MHz, +14 dBm @ MCS9 40/80 MHz
Output power at radio module, 5 GHz	Module 2: IEEE 802.11a/h: +17 up to +18 dBm @ 6 up to 48 Mbps, +13 up to +15 dBm @ 54 Mbps IEEE 802.11n: +17 up to +18 dBm @ 6,5/13/19,5 Mbps (MCS0/8/16, 20 MHz), +11 up to +13 dBm @ 65/130/23 Mbps (MCS7/15/23, 20 MHz), +16 up to +17 dBm @ 15/30/45 Mbps (MCS0/8/16, 40 MHz), +9 up to +12 dBm @ 150/300/450 Mbps (MCS7/15/23, 40 MHz)
Output power at radio module, 2.4 GHz	Module 2: IEEE 802.11b: +22 dBm @ 1 and 2 Mbps, +22 dBm @ 5,5 and 11 Mbps IEEE 802.11g: +22 dBm @ 6 up to 36 Mbps, +20 dBm @ 48 Mbps, +18 dBm @ 54 Mbps IEEE 802.11n: +22 dBm @ 6,5/13/19,5 Mbps (MCS0/8/16, 20 MHz), +16 dBm @ 65/130/195 Mbps (MCS7/15/23, 20 MHz), +21 dBm @ 15/30/45 Mbps (MCS0/8/16, 40 MHz), +15 dBm @ 150/300/450 Mbps (MCS7/15/23, 40 MHz)
Max. radiated power (EIRP), 2.4 GHz band	IEEE 802.11b/g: Up to 20 dBm / 100 mW EIRP (transmission power control according to TPC)
Max. radiated power (EIRP), 5 GHz band	IEEE 802.11a/h: Up to 30 dBm / 1000 mW EIRP (depending on national regulations on channel usage and subject to further obligations such as TPC and DFS)
Minimum transmission power	Transmission power reduction in software in 1 dB steps to min. 0.5 dBm
Receiver sensitivity 5 GHz	Module 1: IEEE 802.11a/h: -95 dBm @ 6 MBit/s, -76 dBm @ 54MBit/s, IEEE 802.11ac: -94 dBm @ MCS0 20 MHz, -76 dBm @ MCS7 20 MHz, -72 dBm @ MCS8 20 MHz, -92 dBm @ MCS0 40 MHz, -76 dBm @ MCS7 40 MHz, -71 dBm @ MCS8 40 MHz, -70 dBm @ MCS9 40 MHz, -90 dBm @ MCS0 80 MHz, -72 dBm @ MCS7 80 MHz, -68 dBm @ MCS8 80 MHz, -67 dBm @ MCS9 80 MHz
Receiver sensitivity 5 GHz	Module 2: IEEE 802.11a/h: -93 dBm @ 6 Mbps, -79 up to -80 dBm @ 54 Mbps, IEEE 802.11n: -93 dBm @ 6,5 Mbps (MCS0, 20 MHz), -77 dBm @65 Mbps (MCS7, 20 MHz), -89 up to -90 dBm @ 15 Mbps (MCS0, 40 MHz), -69 up to -74 dBm @ 150 Mbps (MCS7, 40 MHz)
Receiver sensitivity 2.4 GHz	Module 2: IEEE 802.11b: -90 up to -91 dBm @ 11 Mbps, -101 dBm @ 1 Mbps, IEEE 802.11g: -94dBm @ 6 Mbps, -80 up to 81dBm @ 54 Mbps, IEEE 802.11n: -94 dBm @ 6,5 Mbps (MCS0, 20 MHz), -77 to -78 dBm @ 65 Mbps (MCS7, 20 MHz), -91 dBm @ 15 Mbps (MCS0, 40 MHz), -75 to -76 dBm @ 150 Mbps (MCS7, 40 MHz)
Radio channels 2.4 GHz	Up to 13 channels, max. 3 non-overlapping (depending on country-specific restrictions)
Radio channels 5 GHz	Up to 26 non-overlapping channels (available channels and further obligations such as automatic DFS dynamic channel selection depending on national regulations)
Roaming	Seamless handover between radio cells, IAPP support with optional restriction to an ARF context, IEEE 802.11d support
Opportunistic Key Caching***	Opportunistic key caching allows fast roaming processes between access points. WLAN installations utilizing a WLAN controller and IEEE 802.1X authentication cache the access keys of the clients and are transmitted by the WLAN controller to all mananged access points
WPA2 fast roaming	Pre-authentication, PMK caching, and opportunistic key caching for fast roaming
Concurrent WLAN clients	Up to 255 clients (recommended), 512 clients (max.)***
Fast client roaming	With background scanning, moving LANCOM 'client mode' access points pre-authenticate to alternative access points which offer a better signal before Roaming fails
VLAN	VLAN ID definable per interface, WLAN SSID, point-to-point connection and routing context (4094 IDs) IEEE 802.1q
Dynamic VLAN assignment	Dynamic VLAN assignment for target user groups based on MAC addresses, BSSID or SSID by means of external RADIUS server.
Q-in-Q tagging	Support of layered IEEE 802.1q VLANs (double tagging)
Multi-SSID	Simultaneous use of up to 8 independent WLAN networks per WLAN interface
IGMP snooping	Support for Internet Group Management Protocol (IGMP) in the WLAN bridge for WLAN SSIDs and LAN interfaces for specific switching of multicast packets (devices with integrated WLAN only). Automated detection of multicast groups. Configurable action for multicast packets without registration. Configuration of static multicast group members per VLAN ID. Configuration of query simulation for multicast membership per VLAN ID
Security	IEEE 802.11i / WPA2 with passphrase (WPA2-Personal) or IEEE 802.1X (WPA2-Enterprise) and hardware-accelerated AES, closed network, WEP64, WEP128, WEP152, user authentication, IEEE 802.1x /EAP, LEPS, WPA1/TKIP
EAP Types	EAP-TLS, EAP-TTLS/MSCHAPv2, PEAPv0/EAP-MSCHAPv2, PEAPv1/EAP-GTC, EAP-SIM, EAP-AKA, EAP-AKA Prime, EAP-FAST
RADIUS server	Integrated RADIUS server for MAC address list management
EAP server	Integrated EAP server for authentication of IEEE 802.1X clients via EAP-TLS, EAP-TTLS, PEAP, MSCHAP or MSCHAPv2

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Features as of: LCOS 9.00

WLAN	
Quality of Service	Prioritization according to Wireless Multimedia Extensions (WME, subset of IEEE 802.11e)
U-APSD/WMM Power Save****	Extension of power saving according to IEEE 802.11e by Unscheduled Automatic Power Save Delivery (equivalent to WMM Power Save). U-APSD supports the automatic switch of clients to a doze mode. Increasmed battery lifetime for telephone calls over VoWLAN (Voice over WLAN)
Bandwidth limitation	Maximum transmit and receive rates and an individual VLAN ID can be assigned to each WLAN client (MAC address)
Broken link detection	If the link of a chosen LAN interface breaks down, a WLAN module can be deactivated to let the associated clients search for a new base station
Background scanning	Detection of rogue AP's and the channel information for all WLAN channels during normal AP operation. The Background Scan Time Interval defines the time slots in which an AP or Router searches for a foreign WLAN network in its vicinity. The time interval can be specified in either milliseconds, seconds, minutes, hours or days
Client detection	Rogue WLAN client detection based on probe requests
IEEE 802.1X supplicant	Authentication of an access point in WLAN client mode at another access point via IEEE 802.1X (EAP-TLS, EAP-TTLS and PEAP)
Layer-3 Tunneling	Layer-3 Tunneling in conformity with the CAPWAP standard allows the bridging of WLANs per SSID to a separate IP subnet. Layer-2 packets are encapsulated in Layer-3 tunnels and transported to a LANCOM WLAN controller. By doing this the access point is independent of the present infrastructure of the network. Possible applications are roaming without changing the IP address and compounding SSIDs without using VLANs.
IEEE 802.11u*****	The WLAN standard IEEE 802.11u (Hotspot 2.0) allows for a seamless transition from the cellular network into WLAN hotspots. Authentication methods using SIM card information, certificates or username and password, enable an automatic, encrypted login to WLAN hotspots - without the need to manually enter login credentials.
Note	The effective distances and transmission rates that can be achieved are depending of the site RF conditions
**) Note	Only in installations with WLAN controller
***) Note	The 11ac WLAN module supports max. 128 clients, this specification refers to the combination with the 11n radio module.
****) Note	Feature only available for IEEE 802.11n WLAN module. Feature for IEEE 802.11ac WLAN module in preparation.
LANCOM Active Radio Control	
Client Steering*	WLAN clients are directed actively to the best available access point to provide the best overall load balancing and the highest possible bandwidth for each client. Client Steering can be based on client number, frequency band, and signal strength.
Band Steering	Steering of WLAN clients towards the 5 GHz frequency band by restricting the access to the 2.4 GHz band.
RF Optimization*	Automatic selection of optimal WLAN channels. Due to reduced channel overlaps, WLAN clients benefit from an improved data throughput. In controller-based installations, an automatic selection of optimal channels is conducted for all managed access points.
Adaptive Noise Immunity	By using adaptive noise immunity an access point can cut out sources of interferences in the radio field and focusses on clients with a sufficent signal strength. Therefore, WLAN clients profit by having a higher data throughput available due to less interferences
Spectral Scan (WLAN-2 only)	By scanning the entire RF spectrum, interferences in the WLAN can be identified and graphically illustrated. Up to 13 channels (2.4 GHz) or up to 26 channels (5 GHz) (depending on national regulations and manual configuration). Illustration of signal strength on individual WLAN channels at a certain point of time
*) Note	Only in installations with WLAN controller
IEEE 802.11ac/IEEE 802.11n Features	
MIMO	MIMO technology is a technique which uses multiple transmitters to deliver multiple data streams via different spatial channels. Depending on the existing RF conditions the throughput is multiplied with MIMO technology.
40 MHz Channels	Two adjacent 20 MHz channels are combined to create a single 40 MHz channel. Depending on the existing RF Conditions channel bonding doubles the throughput.
80 MHz Channels	Four 20 MHz channels are combined to create a single 80 MHz channel.
20/40MHz Coexistence Mechanisms in the 2.4GHz Band	Support of coexisting accesspoints with 20 and 40MHz channels in 2.4GHz band.
MAC Aggregation and Block Acknowledgement	MAC Aggregation increase the IEEE 802.11 MAC efficiency by combining MAC data frames and sending it out with a single header. The receiver acknowledges the combined MAC frame with a Block Acknowledgement. Depending on existing RF conditions, this technique improves throughput by up to 20%.
Space Time Block Coding (STBC)	Coding method according to IEEE 802.11n. The Space Time Block Coding improves reception by coding the data stream in blocks.
Low Density Parity Check (LDPC)	Low Density Parity Check (LDPC) is an error correcting method. IEEE 802.11n uses convolution coding (CC) as standard error correcting method, the usage of the more effective Low Density Parity Check (LDPC) is optional.
Maximal Ratio Combining (MRC)	Maximal Ratio Combining (MRC) enables the receiver (access point), in combination with multiple antennas, to optimally combine MIMO signals to improve the client reception at long-range.
QAM-256	Quadrature amplitude modulation providing 256 symbols or 8 bits per carrier

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IEEE 802.11ac/IEEE 802.11n Features	
Short Guard Interval	The guard interval is the time between OFDM symbols in the air. IEEE 802.11n gives the option for a shorter 400 nsec guard interval compared to the legacy 800 nsec guard interval. Under ideal RF conditions this increases the throughput by upto 10%
WLAN operating modes	
WLAN access point	Infrastructure mode (autonomous operation or managed by LANCOM WLAN controller)
WLAN bridge*	Point-to-multipoint connection of up to 16 Ethernet LANs (mixed operation optional), broken link detection, blind mode, supports VLAN When configuring Pt-to-Pt links, pre-configured names can be used as an alternative to MAC Adresses for creating a link. Rapid spanning-tree protocol to support redundant routes in Ethernet networks
WLAN router	Use of the LAN connector for simultaneous DSL over LAN, IP router, NAT/Reverse NAT (IP masquerading) DHCP server, DHCP client, DHCP relay server, DNS server, PPPoE client (incl.Multi-PPPoE), PPTP client and server, NetBIOS proxy, DynDNS client, NTP, port mapping, policy-based routing based on routing tags, tagging based on firewall rules, dynamic routing with RIPv2, VRRP
WLAN client*	Transparent WLAN client mode for wireless Ethernet extensions, e.g. connecting PCs or printers by Ethernet; up to 64 MAC addresses. Automatic selection of a WLAN profile (max. 8) with individual access parameters depending on signal strength or priority
*) Note	Operating mode only available for IEEE 802.11n WLAN module. Operating mode for IEEE 802.11ac WLAN module in preparation.
Firewall	
Stateful inspection firewall	Incoming/Outgoing Traffic inspection based on connection information. Trigger for firewall rules depending on backup status, e.g. simplified rule sets for low-bandwidth backup lines. Limitation of the number of sessions per remote site (ID)
Packet filter	Check based on the header information of an IP packet (IP or MAC source/destination addresses; source/destination ports, DiffServ attribute); remote-site dependant, direction dependant, bandwidth dependant
Extended port forwarding	Network Address Translation (NAT) based on protocol and WAN address, i.e. to make internal webservers accessible from WAN
N:N IP address mapping	N:N IP address mapping for translation of IP addresses or entire networks
Tagging	The firewall marks packets with routing tags, e.g. for policy-based routing; Source routing tags for the creation of independent firewall rules for different ARF contexts
Actions	Forward, drop, reject, block sender address, close destination port, disconnect
Notification	Via e-mail, SYSLOG or SNMP trap
Quality of Service	
Traffic shaping	Dynamic bandwidth management with IP traffic shaping
Bandwidth reservation	Dynamic reservation of minimum and maximum bandwidths, totally or connection based, separate settings for send and receive directions. Setting relative bandwidth limits for QoS in percent
DiffServ/TOS	Priority queuing of packets based on DiffServ/TOS fields
Packet-size control	Automatic packet-size control by fragmentation or Path Maximum Transmission Unit (PMTU) adjustment
Layer 2/Layer 3 tagging	Automatic or fixed translation of layer-2 priority information (IEEE 802.11p-marked Ethernet frames) to layer-3 DiffServ attributes in routing mode. Translation from layer 3 to layer 2 with automatic recognition of IEEE 802.11p-support in the destination device
Security	
Intrusion Prevention	Monitoring and blocking of login attempts and port scans
IP spoofing	Source IP address check on all interfaces: only IP addresses belonging to the defined IP networks are allowed
Access control lists	Filtering of IP or MAC addresses and preset protocols for configuration access
Denial of Service protection	Protection from fragmentation errors and SYN flooding
General	Detailed settings for handling reassembly, PING, stealth mode and AUTH port
URL blocker	Filtering of unwanted URLs based on DNS hitlists and wildcard filters
Password protection	Password-protected configuration access can be set for each interface
Alerts	Alerts via e-mail, SNMP-Traps and SYSLOG
Authentication mechanisms	EAP-TLS, EAP-TTLS, PEAP, MS-CHAP, MS-CHAPv2 as EAP authentication mechanisms, PAP, CHAP, MS-CHAP and MS-CHAPv2 as PPP authentication mechanisms
WLAN protocol filters	Limitation of the allowed transfer protocols, source and target addresses on the WLAN interface
Adjustable reset button	Adjustable reset button for 'ignore', 'boot-only' and 'reset-or-boot'
IP redirect	Fixed redirection of any packet received over the WLAN interface to a dedicated target address

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Features as of: LCOS 9.00

High availability / redundancy	
VRRP	VRRP (Virtual Router Redundancy Protocol) for backup in case of failure of a device or remote station. Enables passive standby groups or reciprocal backup between multiple active devices including load balancing and user definable backup priorities
FirmSafe	For completely safe software upgrades thanks to two stored firmware versions, incl. test mode for firmware updates
Analog/GSM modem backup	Optional operation of an analog or GSM modem at the serial interface
Line monitoring	Line monitoring with LCP echo monitoring, up to 4 addresses for end-to-end monitoring with ICMP polling
Routing functions	
Router	IP and NetBIOS/IP multi-protocol router
Advanced Routing and Forwarding	Separate processing of 16 contexts due to virtualization of the routers. Mapping to VLANs and complete independent management and configuration of IP networks in the device, i.e. individual settings for DHCP, DNS, Firewalling, QoS, VLAN, Routing etc. Automatic learning of routing tags for ARF contexts from the routing table
HTTP	HTTP and HTTPS server for configuration by web interface
DNS	DNS client, DNS server, DNS relay, DNS proxy and dynamic DNS client
DHCP	DHCP client, DHCP relay and DHCP server with autodetection. Cluster of several LANCOM DHCP servers per context (ARF network) enables caching of all DNS assignments at each router. DHCP forwarding to multiple (redundant) DHCP servers
NetBIOS	NetBIOS/IP proxy
NTP	NTP client and SNTP server, automatic adjustment for daylight-saving time
Policy-based routing	Policy-based routing based on routing tags. Based on firewall rules, certain data types are marked for specific routing, e.g. to particular remote sites or lines
Dynamic routing	Dynamic routing with RIPv2. Learning and propagating routes; separate settings for LAN and WAN. Extended RIPv2 including HopCount, Output Delay, Poisoned Reverse, Triggered Update for LAN (acc. to RFC 2453) and WAN (acc. to RFC 2091) as well as filter options for propagation of routes. Definition of RIP sources with wildcards
DHCPv6	DHCPv6 client, DHCPv6 server, DHCPv6 relay, stateless- and stateful mode, IPv6 address (IA_NA), prefix delegation (IA_PD), DHCPv6 reconfigure (server and client), DHCPv6 guard, Lightweight DHCPv6 relay agent
Layer 2 functions	
ARP lookup	Packets sent in response to LCOS service requests (e.g. for Telnet, SSH, SNTP, SMTP, HTTP(S), SNMP, etc.) via Ethernet can be routed directly to the requesting station (default) or to a target determined by ARP lookup
LLDP	Automatic discovery of network topology in layer 2 networks (Link Layer Discover Protocol)
COM port server	
COM port forwarding	COM-port server for the DIN interface. For a serial device connected to it, the server manages its own virtual COM port via Telnet (RFC 2217) for remote maintenance (works with popular virtual COM-port drivers compliant with RFC 2217). Switchable newline conversion and alternative binary mode. TCP keepalive according to RFC 1122 with configurable keepalive interval, retransmission timeout and retries
LAN protocols	
IP	ARP, proxy ARP, BOOTP, DHCP, DNS, HTTP, HTTPS, IP, ICMP, NTP/SNTP, NetBIOS, PPPoE (server), RADIUS, RIP-1, RIP-2, RTP, SIP, SNMP, TCP, TFTP, UDP, VRRP, VLAN
Rapid Spanning Tree	IEEE 802.1d Spanning Tree and IEEE 802.1w Rapid Spanning Tree support for dynamic path selection with redundant layer 2 connections
IPv6	NDP, stateless address autoconfiguration (SLAAC), stateful address autoconfiguration (with DHCPv6), router advertisements, RA guard, ICMPv6, DHCPv6, DNS, HTTP, HTTPS, PPPoE, RADIUS, TCP, UDP
IPv6	
Dual Stack	IPv4/IPv6 dual stack, dual stack lite (IPv4 in IPv6 tunnel)
IPv6 compatible LCOS applications	WEBconfig, HTTP, HTTPS, SSH, Telnet, DNS, TFTP, Firewall, RAS dial-in
WAN protocols	
Ethernet	PPPoE, Multi-PPPoE, ML-PPP, PPTP (PAC or PNS), L2TPv2 (LAC or LNS) and IPoE (with or without DHCP), RIP-1, RIP-2, VLAN, IP
IPv6	IPv6 over PPP (IPv6 and IPv4/IPv6 dual stack session), IPoE (autoconfiguration, DHCPv6 or static)
Tunneling protocols (IPv4/IPv6)	6to4, 6in4, 6rd (static and via DHCP)
WAN operating mode	
xDSL (ext. modem)	ADSL1, ADSL2 or ADSL2+ with external ADSL2+ modem

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Interfaces	
ETH1 (PoE)	10/100/1000 Base-T, autosensing, auto node hub, PoE compliant with IEEE 802.3af/at. The port supports energy saving according to IEEE 802.3az
ETH2	10/100/1000 Base-T, default LAN port, configurable as WAN port. The port supports energy saving according to IEEE 802.3az
DSL over LAN (DSLoL)	One LAN port can (even parallel to LAN mode) be used as a WAN port for connecting external DSL modems (PPPoE) or external routers.
Serial interface	Serial configuration interface / COM port (8 pin Mini-DIN): 9,600 - 115,000 baud, suitable for optional connection of analog/GPRS modems. Supports internal COM port server and allows for transparent asynchronous transmission of serial data via TCP
External antenna connectors	Five reverse SMA connectors for external LANCOM AirLancer Extender antennas or for antennas from other vendors. Please respect the restrictions which apply in your country when setting up an antenna system. For information about calculating the correct antenna setup, please refer to www.lancom-systems.eu
Internal antenna	Radio module 2 uses one internal antenna (WLAN 2 Ant 3).
*) Note	If the WLAN modules are operated in the same frequency band, it is recommended to use extension cables for connecting antennas to the device. This way, they can be positioned further away from each other and, on top of that, interferences are less likely to occur.
LCMS (LANCOM Management System)	
LANconfig	Configuration program for Microsoft Windows, incl. convenient Setup Wizards. Optional group configuration, simultaneous remote configuration and management of multiple devices over IP connection (HTTPS, HTTP, SSH, TFTP). A tree view of the setting pages like in WEBconfig provides quick access to all settings in the configuration window. Password fields which optionally display the password in plain text and can generate complex passwords. Configuration program properties per project or user. Automatic storage of the current configuration before firmware updates. Exchange of configuration files between similar devices, e.g. for migrating existing configurations to new LANCOM products. Detection and display of the LANCOM managed switches. Extensive application help for LANconfig and parameter help for device configuration. LANCOM QuickFinder as search filter within LANconfig and device configurations that reduces the view to devices with matching properties. Central configuration of each management port.
LANmonitor	Monitoring application for Microsoft Windows for (remote) surveillance and logging of the status of LANCOM devices and connections, incl. PING diagnosis and TRACE with filters and save to file. Search function within TRACE tasks. Wizards for standard diagnostics. Export of diagnostic files for support purposes (including bootlog, sysinfo and device configuration without passwords). Graphic display of key values (marked with an icon in LANmonitor view) over time as well as table for minimum, maximum and average in a separate window, e. g. for Rx, Tx, CPU load, free memory. Monitoring of the LANCOM managed switches. Flick easily through different search results by LANCOM QuickFinder
WLANmonitor	Monitoring application for Microsoft Windows for the visualization and monitoring of LANCOM WLAN installations, incl. Rogue AP and Rogue Client visualization. LANCOM QuickFinder as search filter that reduces the view to devices with matching properties
Firewall GUI	Graphical user interface for configuring the object-oriented firewall in LANconfig: Tabular presentation with symbols for rapid understanding of objects, choice of symbols for objects, objects for actions/Quality of Service/remote sites/services, default objects for common scenarios, individual object definition (e.g. for user groups)
Automatic software update	Voluntary automatic updates for LCMS. Search online for LCOS updates for devices managed by LANconfig on the myLANCOM download server (myLANCOM account mandatory). Updates can be applied directly after the download or at a later time
Management	
WEBconfig	Integrated web server for the configuration of LANCOM devices via Internet browsers with HTTPS or HTTP. Similar to LANconfig with a system overview, SYSLOG and events display, symbols in the menu tree, quick access with side tabs. WEBconfig also features Wizards for basic configuration, security, Internet access, LAN-LAN coupling. Online help for parameters in LCOS menu tree
LANCOM Layer 2 Management (emergency management)	The LANCOM Layer 2 Management protocol (LL2M) enables an encrypted access between the command line interfaces of two LANCOM device directly via a Layer 2 connection
Alternative boot configuration	During rollout devices can be preset with project- or customer-specific settings. Up to two boot- and reset-persistent memory spaces can store customized configurations for customer-specific standard settings (memory space '1') or as a rollout configuration (memory space '2'). A further option is the storage of a persistent standard certificate for the authentication of connections during rollouts
Device SYSLOG	SYSLOG buffer in the RAM (size depending on device memory) to store events for diagnosis. Default set of rules for the event protocol in SYSLOG. The rules can be modified by the administrator. Display and saving of internal SYSLOG buffer (events) from LANCOM devices with LANmonitor, display only with WEBconfig
Access rights	Individual access and function rights for up to 16 administrators. Alternative access control on a per parameter basis with TACACS+
User administration	RADIUS user administration for dial-in access (PPP/PPTP). Support for RADSEC (Secure RADIUS) providing secure communication with RADIUS servers
Remote maintenance	Remote configuration with Telnet/SSL, SSH (with password or public key), browser (HTTP/HTTPS), TFTP or SNMP, firmware upload via HTTP/HTTPS or TFTP

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Features as of: LCOS 9.00

Management	
TACACS+	Support of TACACS+ protocol for authentication, authorization and accounting (AAA) with reliable connections and encrypted payload. Authentication and authorization are separated completely. LANCOM access rights are converted to TACACS+ levels. With TACACS+ access can be granted per parameter, path, command or functionality for LANconfig, WEBconfig or Telnet/SSH. Each access and all changes of configuration are logged. Access verification and logging of SNMP Get and Set requests. WEBconfig supports the access rights of TACACS+ and choice of TACACS+ server at login. LANconfig provides a device login with the TACACS+ request conveyed by the addressed device. Authorization to execute scripts and each command within them by checking the TACACS+ server's database. CRON, action-table and script processing can be diverted to avoid TACACS+ to relieve TACACS+ servers. Redundancy by setting several alternative TACACS+ servers. Configurable option to fall back to local user accounts in case of connection drops to the TACACS+ servers. Compatibility mode to support several free TACACS+ implementations
RADIUS	Support of RADIUS protocol for authentication of configuration access. Administrative privileges can be assigned for each administrator.
Remote maintenance of 3rd party devices	A remote configuration for devices behind der LANCOM can be accomplished (after authentication) via tunneling of arbitrary TCP-based protocols, e.g. for HTTP(S) remote maintenance of VoIP phones or printers of the LAN. Additionally, SSH and Telnet client allow to access other devices from a LANCOM device with an interface to the target subnet if the LANCOM device can be reached at its command line interface
TFTP & HTTP(S) client	For downloading firmware and configuration files from a TFTP, HTTP or HTTPS server with variable file names (wildcards for name, MAC/IP address, serial number), e.g. for roll-out management. Commands for live Telnet session, scripts or CRON jobs. HTTPS Client authentication possible by username and password or by certificate
SSH & Telnet client	SSH-client function compatible to Open SSH under Linux and Unix operating systems for accessing third-party components from a LANCOM router. Also usable when working with SSH to login to the LANCOM device. Support for certificate- and password-based authentication. Generates its own key with sshkeygen. SSH client functions are restricted to administrators with appropriate rights. Telnet client function to login/administer third party devices or other LANCOM devices from command line interface
HTTPS Server	Option to choose if an uploaded certificate or the default certificate is used by the HTTPS server
Security	Access rights (read/write) over WAN or (W)LAN can be set up separately (Telnet/SSL, SSH, SNMP, HTTPS/HTTP), access control list
Scripting	Scripting function for batch-programming of all command-line parameters and for transferring (partial) configurations, irrespective of software versions and device types, incl. test mode for parameter changes. Utilization of timed control (CRON) or connection establishment and termination to run scripts for automation. Scripts can send e-mails with various command line outputs as attachments
Load commands	LoadFirmware, LoadConfig and LoadScript can be executed conditionally in case certain requirements are met. For example, the command LoadFirmware could be executed on a daily basis and check each time if the current firmware is up to date or if a new version is available. In addition, LoadFile allows the upload of files including certificates and secured PKCS#12 containers
SNMP	SNMP management via SNMPv2, new unified private MIB for all most current and future LANCOM devices with LCOS. Download link in WEBconfig
Timed control	Scheduled control of parameters and actions with CRON service
Diagnosis	Extensive LOG and TRACE options, PING and TRACEROUTE for checking connections, LANmonitor status display, internal logging buffer for SYSLOG and firewall events
LANCOM WLAN controller	Supported by all LANCOM WLAN controller (separate optional hardware equipment for installation, optimization, operating and monitoring of WLAN networks, except for P2P connections)
Statistics	
Statistics	Extensive Ethernet, IP and DNS statistics; SYSLOG error counter
Accounting	Connection time, online time, transfer volumes per station. Snapshot function for regular read-out of values at the end of a billing period. Timed (CRON) command to reset all counters at once
Export	Accounting information exportable via LANmonitor and SYSLOG
Hardware	
Power supply	12 V DC, external power adapter (230 V) with bayonet cap to protect against accidentally unplugging
Power supply	Via Power over Ethernet, compliant with IEEE 802.3af*/at
Environment	Temperature range 0–40°C a vertical mounting position using the LANCOM Wall Mount; Temperature range 0–35°C a horizontal mounting position; humidity 0–95%; non-condensing; In order to prevent overheating of the device the WLAN modules are deactivated automatically.
Mounting	Recommended mounting via LANCOM Wall Mount with the device's front facing downwards.
Housing	Robust synthetic housing, rear connectors, ready for wall mounting, Kensington lock; 210 x 45 x 140 mm (W x H x D)
Power consumption (max)	Approx. 18.9 W via 12V/1.5 A power adapter (value refers to the overall power for the access point and power adapter), about 16 W via PoE (value refers to the power for the access point only)
*) Note	It is recommended to use a PoE adapter or switch with IEEE 802.3at support. Using PoE with IEEE 802.3af the number of spatial streams is limited.
Declarations of conformity*	
CE	EN 60950-1, EN 301 489-1, EN 301 489-17

LANCOM L-1302acn dual Wireless

Features as of: LCOS 9.00

Declarations of conformity*	
2.4 GHz WLAN	EN 300 328
5 GHz WLAN	EN 301 893
Notifications	Certifications notified in Germany, Belgium, Netherlands, Luxembourg, Austria, Switzerland, UK, Italy, Spain, France, Portugal, Czech Republic, Denmark
IPv6	IPv6 Ready Gold
*) Note	You will find all declarations of conformity in the products section of our website at www.lancom-systems.eu
Scope of delivery	
Manual	Hardware Quick Reference (EN, DE), Installation Guide (DE/EN/FR/ES/IT/PT/NL)
CD/DVD	Data medium with management software (LANconfig, LANmonitor, WLANmonitor, LANCAPI) and documentation
Cable	1 Ethernet cable, 3 m
Antenna	Five 4-5 dBi dipole dual-band antennas (plus one integrated dual-band antenna in the device)
Power supply unit	External power adapter (230 V), NEST 12 V/1.5 A DC/S, coaxial power connector 2.1/5.5 mm bayonet, temperature range from -5 to +45° C, LANCOM item no. 110723 (EU)/LANCOM item no 110829 (UK)
Support	
Warranty	3 years support via hotline and Internet KnowledgeBase
Software updates	Regular free updates (LCOS operating system and LANCOM Management System) via Internet
Options	
Advance Replacement	LANCOM Next Business Day Service Extension CPE, item no. 61411
Warranty Extension	LANCOM 2-Year Warranty Extension CPE, item no. 61414
Public Spot	LANCOM Public Spot Option (authentication and accounting software for hotspots, incl. Voucher printing through Standard PC printer), item no. 60642
Accessories	
LANCOM Large Scale Monitor	Powerful monitoring system for WLAN, VPN, and LAN infrastructures of mid-sized to large networks, upgradable for up to 1000 monitored devices, for a proactive error management, browser-based remote monitoring, intuitive user interface, graphic floorplans, configurable triggers for alarms and messages, users, roles, and rights management, item no. 62910
LANCOM WLC-4006+ (EU/UK/US)	LANCOM WLAN controller for central management of 6 (opt. up to 30) LANCOM access points and WLAN routers, item no. 62035 (EU), item no. 62036 (UK) and item no. 62037 (US)
LANCOM WLC-4006 (EU/UK)	LANCOM WLAN controller for central management of 6 or 12 LANCOM access points and WLAN routers, item no. 61367 (EU) and item no. 61368 (UK) - only stock devices, article is no longer available
LANCOM WLC-4025+ (EU/UK/US)	LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61378, item no. Art.-Nr. 61379 and item no. 61384 (US)
LANCOM WLC-4025 (EU/UK)	LANCOM WLAN controller for central management of 25 (opt. up to 100) LANCOM access points and WLAN routers, item no. 61550 (EU) and item no. 61551 (UK) - only stock devices, article is no longer available
LANCOM WLC-4100 (EU/UK)	LANCOM WLAN controller for central management of 100 (opt. up to 1000) LANCOM access points and WLAN routers, item no. 61369 (EU) and item no. 61377 (UK)
External antenna*	AirLancer Extender O-D80g 2.4 GHz 'dual linear' polarisation diversity outdoor sector antenna, item no. 61221
External antenna*	AirLancer Extender O-D60a 5 GHz 'dual linear' polarisation diversity outdoor sector antenna, item no. 61222
External antenna	AirLancer Extender I-D180agn dual-band indoor antenna, item no. 60917
External antenna*	AirLancer Extender O-D9a 5 GHz 'dual linear' polarisation diversity outdoor antenna, item no. 61224
Antenna cable	AirLancer cable NJ-NP 3m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61230
Antenna cable	AirLancer cable NJ-NP 6m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61231
Antenna cable	AirLancer cable NJ-NP 9m antenna cable extension for connection with LANCOM outdoor antennas, item no. 61232
Surge arrestor (antenna cable)	AirLancer Extender SA-5L surge arrestor (2.4 and 5 GHz), to be integrated between Access Point and antenna, item no. 61553
Surge arrestor (LAN cable)	AirLancer Extender SA-LAN surge arrestor (LAN cable), item no. 61213
LANCOM Wall Mount	For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61349

Accessories	
LANCOM Wall Mount (White)	For simple, theft-proof mounting of LANCOM devices with plastic housings, item no. 61345
Analog modem backup/serial adapter	LANCOM Serial Adapter Kit, item no. 61500
*) Note	The Polarization Diversity antennas require 2 cables and surge arrestors
Item number(s)	
LANCOM L-1302acn dual Wireless (EU/UK)	61732(EU), 61733(UK)

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